

We claim:

1. A method of making a hydrophobic carbon fiber construction comprising the steps of:

- 5 a) immersing a carbon fiber construction in an aqueous dispersion of a highly fluorinated polymer;
- b) contacting said dispersion with a counterelectrode; and
- c) electrophoretically depositing said highly fluorinated polymer on said carbon fiber construction by applying electric current between said carbon fiber construction and said counterelectrode.

10 2. The method according to claim 1 wherein said highly fluorinated polymer is selected from the group consisting of polytetrafluoroethylene (PTFE), fluorinated ethylene propylene (FEP), perfluoroalkyl acrylates, hexafluoropropylene copolymers, and tetrafluoroethylene/hexafluoropropylene/vinylidene fluoride terpolymers.

15 3. The method according to claim 1 wherein said highly fluorinated polymer is polytetrafluoroethylene (PTFE).

20 4. The method according to claim 1 wherein said carbon fiber construction is a woven carbon fiber construction.

5. The method according to claim 1 wherein said carbon fiber construction is a non-woven carbon fiber construction.

25 6. The method according to claim 1 wherein said step of electrophoretically depositing said highly fluorinated polymer has a duration of not more than 30 minutes.

7. The method according to claim 1 wherein said step of electrophoretically depositing said highly fluorinated polymer has a duration of not more than 15 minutes.

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8. The method according to claim 1 wherein said electric current is applied at a voltage of between 6 and 100 volts.

9. The method according to claim 1 additionally comprising the step of: d)  
5 sintering said highly fluorinated polymer by heating said carbon fiber construction.

10. The hydrophobic carbon fiber construction made according to the method of claim 1.

10 11. The hydrophobic carbon fiber construction made according to the method of claim 9.

12. The hydrophobic carbon fiber construction according to claim 10 which is coated with a monolayer of particles of a highly fluorinated polymer.

15 13. The hydrophobic carbon fiber construction according to claim 11 which is coated with a monolayer of particles of a highly fluorinated polymer.

20 14. A hydrophobic carbon fiber construction coated with a monolayer of particles of a highly fluorinated polymer.

15. The hydrophobic carbon fiber construction according to claim 14 wherein said highly fluorinated polymer is selected from the group consisting of polytetrafluoroethylene (PTFE), fluorinated ethylene propylene (FEP), perfluoroalkyl acrylates, hexafluoropropylene copolymers, and  
25 tetrafluoroethylene/hexafluoropropylene/vinylidene fluoride terpolymers.

16. The hydrophobic carbon fiber construction according to claim 14 wherein said highly fluorinated polymer is polytetrafluoroethylene (PTFE).

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17. The hydrophobic carbon fiber construction according to claim 14 wherein said carbon fiber construction is a woven carbon fiber construction.

18. The hydrophobic carbon fiber construction according to claim 14 wherein said  
5 carbon fiber construction is a non-woven carbon fiber construction.

19. The hydrophobic carbon fiber construction according to claim 14 wherein said particles of a highly fluorinated polymer are sintered.

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